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The Contribution of Communities of Practice in an innovative enterprise

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Abstract

The emergence of the Web has brought proximity and favored partnership among different groups viewing to cooperate in the generation of knowledge and in the process of innovation. Among the organizational forms of cooperation, the communities of practice (COPs) have been notable as a propitious activity for joining work groups aiming at creating and sharing knowledge as well as problem solving (Wenger et al., 2002). For some authors, communities of practice have always been part of the informal structure of any organization. However, IT has made it possible to exchange knowledge and ideas at an unprecedented pace. The aim of this paper is to analyze the formation and performance of communities of practice as a tool for enterprise innovation. The methodology used in this paper is based on a case study of a multinational company whose performance as an innovative enterprise has been outstanding.

Keywords:

Communités of practice, work groups, innovation strategy, process of innovation, sharing knowledge.

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1- Introduction

Changes in the increasingly competitive global market have led organizations to search for strategies that enable them to acquire and create new knowledge. Being ready for a continual innovation is surely a must. New products and processes have become the most sought-after target. Nevertheless, creating new products and processes that satisfy the demanding and sophisticated society of knowledge is quite a complex task.

The challenge of continual innovation for keeping competitiveness has stirred business companies to promote organizational learning as an essential condition for constructing knowledge. In a review of the literature by Antonello and Ruas (2005), knowledge is seen as emerging from an active participation in the daily and working lives, which surely allows us to understand the workplace as a propitious locus for the learning process and which stimulates the learning by doing. Learning is thought to be acquired through practice and it may happen while someone is working, by accomplishing assigned tasks or work relations. The authors also emphasize that one of the most prolific approaches on learning by doing is the one focusing on informal learning in the communities of practice. These authors understand informal learning as that *which occurs naturally as part of a workday – such as an exchange of criticism as to the effectiveness of goal achievements – and the one that bears an encouraging and challenging environment and development move for all collaborators as well* (Antonello and Ruas, 2005).

Businesses – mainly those knowledge-intensive companies – have been endeavoring to adopt management practices that allow for a propitious environment for exchange of information and participation so as to make it easier learning and knowledge sharing. Interaction with environment becomes an imperative feature: consumers, suppliers, universities, if it is taken for granted that knowledge relies on activities rendering proximity between specific and actual professional abilities and practices, which favors experience exchanges, socialization and knowledge sharing (Wenger and Snyder, 2000; Wenger; McDermont and Snyder, 2002; Ardichivili; Vaughn and Wentling, 2003).

Communities of practice have been recognized as tools impelling the generation of new knowledge and an innovation support. Barros and Carvalho (2004) emphasize the relevance of communities such as these in civil service organizations too, seeking to improved public administration and technological development of processes and services.

The term Community of Practice (COP) has been frequently used in recent works of knowledge management and theories of learning. Terra (2005) reminds us that the concept is not a new idea, but its use in the organizational context is a recent phenomenon and it has been used in the management area in the present decade only. The expression was first used by Wenger (1999) to refer to informal groups of people acting in specific fields of knowledge to solve problems in their areas of activity.

The emergence of the Web has favored proximity and partnership of different groups working with new information technologies aiming to cooperate in the creation of knowledge and in the process of innovation.

The present work – by means of a case study – aims at understanding the communities of practice's implementation and performance. The study was carried out within a company taken as an innovative enterprise, and this idea was used as a management tool, having in mind to improve the understanding of COPs and to contribute to an appropriate use of such a tool in the enterprises seeking innovation.

The paper is structured as follows: a review of the literature is presented after an introduction to the subject as well as to the concept of COPs in knowledge management; thirdly, an implementation mapping and performance of the analyzed COP are presented; and finally there follow some comments, conclusions, and suggestions for future research effort.

2- Conceptual frame: a short review of the literature on communities of practice (COPs)

In the organizational context, the *communities of practice* (COPs) are defined as informal groups of people seeking knowledge and information so as to solve problems in their specific fields of work. Among the different forms of collaboration, COPs have proved to be a propitious activity to the formation of groups working for knowledge generation and sharing, and problem solving as well (Wenger and Snyder, 2002).

Ever since the definition devised by Wenger was made public (1999), the concept of communities of practice (COP) has been revisited by several academics. Sharing of knowledge seems to be the most relevant aspect of the concept however. Tremblay (2004), taking recourse of previous studies, presents some definitions of communities of practices that give relevance to the sharing and learning processes:

- Communities of practice are groups of people who share a given concern, a set of problems or are enthusiastic about a given subject and thus deepen their knowledge and expertise in the area by means of interaction (Wenger, McDermont and Snyder, 2002).
- Communities of practice is understood as a group whose members are regularly engaged in learning and knowledge exchange, based on common interests (Lesser and Stork, 2001:831)³
- Communities of practice are not usually structured formally as departments or project teams. *They are informal groups, present in the minds of their members who get together due to their common interests and for solving and sharing specific problems and areas of action* (Ardichivili, A.; Vaughn, P.; Wentling, T., 2003).

Creating knowledge in COPs takes place when people participate in the solution of a problem and exchange the necessary knowledge to solve it. Scholars have stressed that creating and maintaining COPs is a relevant alternative for the formation of teams, mainly in the context of the development of new products and other knowledge-intensive tasks (Wenger, 2000; Nirenberg, 1994; Stewart, 1997).

According to Dougherty (1995), quoted by Ardichivili et al. (2003), among the reasons justifying COPs as efficient tools for creating and sharing knowledge is the fact that a good many of the enterprises' competitive advantages are based on intangible and tacit knowledge of their collaborators. The author emphasizes that competences can not be found, except with those people. Therefore, not only new knowledge but also abilities and experiences are discussed and disclosed in their webbed conversations and activities.

Terra (2005) emphasizes that the need to bear new knowledge, share it and rapidly innovate turns the idea of community of practice into an increasingly more relevant and promising concept for the management of any enterprise. Sharing knowledge makes much more sense in a context of a community of practice, since it joins people with common interests as to learning and exchanging experiences in their specific area of activity, which favors reciprocal trust and spontaneous participation. In analyzing the knowledge flow in the communities of practice, this author stresses that Leonard Barton, by researching on the impact of knowledge sharing, has shown that isolated communities tend to become stagnant, leading to unyielding competences (Terra, 2005).

³ Lesser & Stork, 2001, p.831, cited in Michell, 2002.

Communities of practice are related to varied subjects, which indicate a trend to the formation of electronic communication webs through the Internet. The development of information technologies (ITs) has undeniably potentialized and made COPs' actions brisk and these communities are now recognized as virtual knowledge webs, which are essential for creating, sharing, codifying, and managing knowledge for the innovation processes (Brow; Duiguid, 1991; Weick; Westley, 1996).

The use of ITs has strengthened the collaborative arrangements in knowledge production and permitted concepts like communities of practice to widely spread around the world (Wenger; Snyder, 2000) ; Constellations of Communities (CoC) (Wenger, 1999, quoted by Ward, 2002)⁴; Invisible Colleges (Price, 1963 quoted by Macedo, 1999)⁵.

Tremblay (2004), taking recourse to McDermott's definition (2000), emphasizes that virtual communities of practice are simpler than groups working at a distance. The participants are people with a common mission, with a common task and who should produce something based on exchange and sharing of information within the group. Working groups traditionally work under predetermined targets and time; their tasks are usually clearly defined and performed within an established workday scheme; groups are frequently dissolved once the target has been achieved, although a trend to assign them other collective tasks persists in the manufacturing sector (Tremblay & Rolland, 1998). Furthermore, work groups are characterized as having a clearly defined division of tasks, which is not the case in the communities of practice. The latter are distinguished by an intense cooperation among their members regardless of time span, daily work schedule or work supervision (Tremblay; Rolland; Davel, 2000).

Thus, in contrast with work groups, communities of practice have broad and less-defined targets, and they are

⁴ Wenger, E., 1999, quoted by Ward, A . *Strategy & Leadership. Getting strategic value from constellation of communities*. MCV University Press. 2000. Available from: <http://titania.emeraldinsight.com> [cited March 2005]

⁵ Macedo, T.M.B., 1999. *Redes informais nas organizações: a co-gestão do conhecimento*. MA – Convênio INT/IBICT/ Universidade Federal do Rio de Janeiro.

not committed to specific time schedule or deadlines to achieve their objectives and are not assigned a predetermined workday scheme as well.

Tremblay, 2004, quoting McDermont, 1999, 2001; Wenger; Snyder, 2000, stresses that communities of practice, like work groups, perform joint work tasks and require some preconditions – e.g. mutual trust among their members. This is even more important in the communities of practice, since their members are expected to share tacit knowledge so as to build new knowledge and eventually new products and services.

In this sense, some authors have encouraged the formation of some communities of practice based on existing informal groups, which share the same values, and as they trust one another. In view of an impossible face-to-face relationship in a globalized world, in which multinational companies are spread all over, virtual communities of practice grounded on the Internet are alternatives for exchanging knowledge and information (Ardichivili, Vaughn and Wentling 2003).

Virtual confidence among the members of the communities of practice is indeed a challenge as it has to be construed among people living at a physical distance from one another. Some prerequisites are also important and frequently mentioned in the literature: the existence of a stirring leader in the community and the organization's support are factors that maintain the individual's interest and motivation to work in a group. This organizational support may be granted by means of a financial reward or through a simple acknowledgement by the organization's hierarchical authority (Wenger, McDemont and Snyder 2002)

The available technology is another necessary condition for the work of communities of practice. However, some research indicates that human resources and organizational challenges play more relevant roles than technology as far as success or failure of communities of practice is concerned. Contemporary authors recognize the determinant effect of organizational context on the involvement and effectiveness of work groups (Guzzo and Shea 1992; Sundstrom, De Meuse and Futrell 1990; Hackman 1987). The several dimensions of the organizational context – such as available technology, human resource policy as well as management support and involvement and organizational structure, all considered as essential for work groups –, have been tested in Tremblay's research (2004), which confirmed the relevance of such dimensions for the performance of the virtual COPs.

Terra (2005) draws attention to some benefits granted by the communities of practice for their participants:

- They are trustable learning environments.

- They provide workers with a filter which helps them deal with excess information.
- They make learning with experts and colleagues possible, keeping them updated in their fields of work.
- They encourage participation, call for the human socialization need as well as the need to identify oneself with other people.

In view of such a conceptual frame of communities of practice and the conditions for their implementation, the experience of the Siemens' ShareNet as a proposal for analysis was taken as the object of this case study.

3- Management Practices and Tools of Knowledge for Information: Communities of Practice of Siemens.

The present research study aimed at identifying management practices and tools of knowledge at Siemens and, more specifically, the conditions for implementing the ShareNet and its contribution to innovation.

In the beginning of 1995, the globalized market challenge, business increasing complexity, and structural changes of the world economy led Siemens executives to recognize the importance of international cooperation and management of knowledge. An attitude toward change was taken that quite easily established a proactive knowledge search for implementing an internal culture of knowledge and information sharing and exchange.

The president and main CEO of Siemens, Heinrich von Pierer, determined that the company's expertise should be systematically and intensively explored:

“Our first priority – and this will be vital for our future effectiveness – is the electronic networking and management of our internal knowledge, in order to make us even more efficient and to bring our customers greater benefits. Our ultimate goal is to ensure that all of our people can access the company's unequalled pool of knowledge at the right time – and to do this systematically and not just by accident.”

From 1997, the company started changing in order to embody the ideas of the communities of practice. Until 1980, Siemens' telecommunication equipment was monitored by the *Companhia Telefônica*, a telephony supplier in Brazil. As a matter of fact, suppliers determined what kind of equipment should be used then. Times have changed! After a two-decade time span, technological advances and computer science led to a boom of new products and specialized services. New business

opportunities appeared. The company faced a new business approach: services and solutions, which were based on complexity and intensiveness of knowledge, leading to reinforce the culture of knowledge sharing and information exchange.

In May 1999, the Information Communication Network ShareNet – ICN ShareNet, a network tool for the activities of knowledge sharing, was created using means of synchronous (network chats) and asynchronous (search machines, news, discussion forums, document management, urgent orders, among others) collaboration technologies which favored the communities of practice's performance. The community has rapidly increased based on the availability of a communication network for thousands of users spread all over the world. Due to the synergy between the Information Communication Network (ICN) and the Information Communication Mobile (ICM), many ICM's employees have chosen to join the ICN ShareNet. As a result, the system was renamed and the two ICN/ICM groups were merged into the *Siemens Communication* in 2003. Nowadays, with a new name – *Com. ShareNet* – it boasts on 17,500 users in 70 countries. English is their common language.

The company's practices and tools of knowledge management may be briefly divided into three different kinds: knowledge sharing; e-learning; and management of competence networks.

These communities are supported by a tool named ShareNet for the company's knowledge management, which has been created to provide the infrastructure needed for the community performance and has been maintained by a group of technology experts.

Three kinds of practices and tools for knowledge sharing have been used, as follows:

- the Siemens ShareNet – a worldwide tool for knowledge sharing of the communities of practice through the use of synchronous (network chats) and asynchronous (search machines, news, forums, document management, urgent orders, among others) collaboration technologies;
- the People ShareNet – a worldwide sharing practice of intellectual resources, based on demand and supply of knowledge, which aims at fostering knowledge interchange by means of the face-to-face and job-rotation (knowledge socialization) learning;
- the Happy Hour of Knowledge – an informal lecture practice by means of which knowledge – essential to the organization – is implicitly and spontaneously shared.

Such practices include the e-learning, a learning tool of the company's intranet that allows for the creation of e-learning material in a decentralized and collaborative way demanding no previous specialized computer knowledge by the participants. It also allows the following-up of the collaborators' performance as they take part in the lectures.

Finally, as to the management of the competence networks, the company has another tool (Athena), through which every user is able to know "who knows what" in the company. This tool is also able to provide a mapping of the competence distribution within the company. This tool is informally called the company's yellow pages, as an analogy with the telephone directory which contains addresses and telephone numbers of businesses and professionals offering their products and services.

3.1. The Com.ShareNet Advantages

The concepts of consumer and production have undergone changes which characterize a new relation between businesses and consumers. Nowadays, the integration system of abilities is increasingly called for by a kind of demand that in turn is increasingly requiring and sophisticated. Business units within the company develop solutions and products, and branch units are in charge with customization and integration of consumer networks.

In order to optimize collaboration between all the involved departments and business partners, Com.ShareNet endeavors to gather innovative collaborators through a communication network that embodies several concepts and projects, which feed a continual information and knowledge sharing. Communities of practice are created, which interact in problem solving, exchange of experiences, generation of new knowledge, and reuse of organizational knowledge.

A basic element of Com.ShareNet is a robusta and trustable intranet, which eases the knowledge flow through three processes: capture, development, and reuse of knowledge. The system covers two kinds of knowledge: codified knowledge and personalized knowledge. The codified knowledge provides the user with a structured knowledge to be used in specific problem solving. It includes: sales projects, technical solutions, functional solutions, information on consumption, market, and competitors. The personalized knowledge includes urgent orders for specific problem solving, group discussions, news, etc.

The Com.ShareNet favors the development of professional abilities and acts as a knowledge transfer and dissemination mechanism. The communities of practices – COPs, which are established in such a context, provide a propitious

environment for organizational learning and feed the company's innovation process.

The Com.ShareNet also helps to recruit new talents by means of the effect of external connections of their members. As for retaining talents, there are other components to perform this task, such as culture, remuneration, tolerance to mistakes, professional and material progress. A byproduct of communities of practice pointing toward such talent retention is that companies that adopt participatory management, in which communication is more horizontal favor the existence of COPs.

As regards trust among collaborators, one can observe that confidence progresses, insofar as COPs bring people closer to a common goal whose aim is reciprocal understanding. In such a process, community members have gains and take risks that strengthen their relations as they overcome challenges and recognize their joint success. The rationale behind this is that experience is relevant as it builds up common identities and nears the interests of its members.

3.2. Some success examples stemming from COPs at Siemens in Brazil:

Effects of COPs' actions on innovation capacity of Siemens by means of knowledge transfer between relevant R&D institutions and the company can be observed. The company is presently adopting different modes of knowledge sharing:

For example, as for the business unit *Informática e Comunicações* (IC – Information and Communications), there is a close interaction between the Curitiba industrial plant and the *Centro Internacional de Tecnologia de Software* [CITS – International Center for Technology of Software] and the *Centro Federal de Educação Tecnológica* (CEFET-PR – a federal college for technical education in the state of Paraná). Another example is the implementation of an important cooperation for knowledge transfer between Siemens research institutions in Manaus as the *Instituto Genius*, *Fundação Centro de Análise e Inovação Tecnológica – FUCAPI* and *Fundação Feitosa* aiming at developing software for mobile cellphones. The most recent results of such a joint endeavor was the creation of the newly software application of the Palm cellular SX1 of Siemens, the transfer of the Center for the Development of Exchange Stations for enterprises from USA to Brazil as well as several R&D contracts for export signed between Siemens and national research institutions.

Internal statistics revealed that collaborators involved with the ShareNet save three- monthly working hours on average, which means a monthly projection of €63.0 (Sixty Three) million in worldwide productivity gains.

How is the generated knowledge preserved or how is current knowledge codified for further use? Data and information feeding by the ShareNet collaborators is spontaneous and are not previously censured or filtered. The quality of knowledge generated and stored in databanks for further searches is as result of an evaluation of contributions made by the users themselves who – in a joint effort with the community – are in charge with its validation, which allows for future use.

4- Comments and Conclusions

This study has concluded that the communities of practice (COPs) play a relevant strategic role for the company management with a view to feed the process of continual innovation. All knowledge gathered is made available to the respective COPs so as to permit a swift access to the accumulated knowledge and favor organizational learning.

The Com.ShareNet has contributed to establish the company's strategies since it is in line with the corporate goals, and the COPs have broadened horizontal knowledge sharing in detriment to vertical and centralized knowledge. A potent IT infrastructure focused on the user together with knowledge management software strengthens such an effect at Siemens.

It is quite clear that the tool is able to create new products, services and open new markets as it expands outer connections of the company through the COPs' members. This surely is an important effect for mature companies, since radical innovation that includes conceptual innovation (new business lines and models) confronts a set of consolidated values within the very company. External connections do contribute to stir up new concepts and experiences. COPs are, by their nature, open to external connections and not hermetically sealed and exclusive of their members.

People interviewed believe that COPs favor a more rapid problem solving when multifunctional groups participate in exerting decision power. Diversity and knowledge allow an enlarged approach to the problem and decision power converts knowledge and competence into the needed solution.

One of the main conclusions of this research study was to confirm Tremblay's assertion (2004) that the organizational context supporting the COPs has a determinant effect on knowledge sharing in the interorganizational integration and constitutes a basic element for the success of the COPs. It is worth noting that the organization members think of their participation in the COPs as a means of self-improvement and learning.

Considering that virtual communities of practice are a novel phenomenon, studies dedicated to them are expected to contribute to a better understanding and use of the concept. This study did not go further in the identification of barriers to knowledge sharing and participation in COPs. This point deserves further research studies aiming at the understanding of the mechanisms of trust among members of the community within the organization.

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